Agency for Healthcare Research and Quality
Advancing Excellence in Health Care

NATIONAL GUIDELINE CLEARINGHOUSE

General

Guideline Title

Evidence-based care guideline for conservative management of lateral patellar dislocations and instability in children and young adults aged 8-25 years.

Bibliographic Source(s)

Cincinnati Children's Hospital Medical Center. Evidence-based care guideline for conservative management of lateral patellar dislocations and instability in children and young adults aged 8-25 years. Cincinnati (OH): Cincinnati Children's Hospital Medical Center; 2014 Mar 18. 30 p. [100 references]

Guideline Status

This is the current release of the guideline.

Recommendations

Major Recommendations

The strength of the recommendation (strongly recommended, recommended, or no recommendation) and the quality of the evidence (1aâ€'5b) are defined at the end of the "Major Recommendations" field.

General Recommendations

1. It is recommended that patients begin physical therapy upon diagnosis of primary patellar dislocation (PPD) or recurrent patellar instability (RPI) in order to minimize secondary impairments such as persistent gait abnormalities, range of motion (ROM) deficits, and muscle atrophy that can result from poor gait patterns, immobility and disuse (Local Consensus, 2013 [5]).
2. It is recommended that throughout the diagnosis and rehabilitation process, physical therapists are in open communication with the referring physician and any other team members involved in order to promote the best, most efficient and optimally effective quality of care (Local Consensus, 2013 [5]; "American Physical Therapy Association," 2003 [5a]).
3. It is recommended that the patient and family members receive thorough education regarding the nature of injury, the plan of care, and the risks for future injury (Local Consensus, 2013 [5]; "American Physical Therapy Association," 2003 [5a]).
   Note: When educating the patient and family, it may be necessary to provide additional education about any factors specific to the patient that could potentially affect the patient's rehabilitation process and long-term prognosis. For example, if the patient has any anatomical abnormalities (e.g., patella alta), the clinician may want to inform the patient and family about the increased likelihood for re-occurrence of the injury relative to someone with PPD or RPI who does not have any anatomical variations (Local Consensus, 2013 [5]).
4. It is recommended that the referring physician is notified if any of the following red flags/precautions are present during the initial evaluation

or at any other time during the rehabilitation process:

- Signs of deep vein thrombosis (Local Consensus, 2013 [5])
- Unchanging or increased irritability in the knee (Local Consensus, 2013 [5])
- Persistent or recurrent effusion (Stefancin & Parker, 2007 [1b]; Local Consensus, 2013 [5])
- Unexpected loss or minimal progression of ROM (Local Consensus, 2013 [5])
- Catching, locking, or persistent pathological end feel with passive ROM (Stefancin & Parker, 2007 [1b]; Local Consensus, 2013 [5])

Note: It is estimated that approximately 20% to 40% of the PPD patient population suffer concomitant symptomatic osteochondral injuries (Nietosvaara, Aalto, & Kallio, 1994 [3b]) and up to 95% of patients with RPI possess chondral lesions (Slabaugh et al., 2010 [5a]). Therefore, if at any point during the rehabilitation, a patient experiences catching, locking or a persistent pathological end feel with passive ROM, the physical therapist may need to consider the possibility that an underlying chondral lesion or loose body could be present (Local Consensus, 2013 [5]).

Initial Examination

5. It is recommended that a thorough chart review is performed that includes review of general medical history and imaging studies (e.g., radiograph, computed tomography [CT] scan, magnetic resonance [MR] images) with an emphasis on identifying conditions or potential complications such as:
    - Trochlear dysplasia
    - Patellar dysplasia
    - Osteochondral defects
    - Soft tissue disruptions or abnormalities (e.g., medial patellofemoral ligament [MPFL] tear)
    - Bone bruises

    Note: See Appendix 1 in the original guideline document for descriptions for additional measures for radiographic images (Local Consensus, 2013 [5]; "American Physical Therapy Association," 2003 [5a]).

6. It is recommended that pain is assessed and localized using an appropriate scale (Local Consensus, 2013 [5]).
    Note: The Oucher/Faces Pain Scale can be used with children 4 to 16 years of age (Beyer et al., 2005 [4a]) or the Numerical Rating Scale (NRS) can be used with children age 6 years and older and adults (von Baeyer et al., 2009 [4b]; Williamson & Hoggart, 2005 [5a]).

7. It is recommended that a thorough history including the following information is obtained from the patient and/or family:
    - Age
    - Sex
    - Previous activity level
    - Prior history of other musculoskeletal injuries and health conditions
    - Patient and family history of patellar dislocation and hypermobility
    - Description of mechanism of injury
    - Description of prior/current treatment
    - Complaints of "giving way"/feeling of instability
    - Brace use
    - Medications
    - Weight-bearing status
    - Restrictions/precautions
    - Patient/family goals
    - Date of next follow up visit with referring physician

    (Stefancin & Parker, 2007 [1b]; Local Consensus, 2013 [5]; "American Physical Therapy Association," 2003 [5a]; Wilk et al., 1998 [5a]; Andrish, 2008 [5b])

8. It is recommended that a comprehensive objective physical therapy examination be completed, including the components named in Table 2 in the original guideline document (Local Consensus, 2013 [5]; "American Physical Therapy Association," 2003 [5a]).
9. It is recommended that a comprehensive knee screen is performed to evaluate for additional conditions or complications of other important bony and soft tissue structures such as:
    - Anterior cruciate ligament
    - Posterior cruciate ligament
    - Medial collateral ligament
    - Lateral collateral ligament

- Menisci

(Local Consensus, 2013 [5])

10. It is recommended that joint hypermobility be assessed to determine potential ligamentous laxity as an associated risk factor (Local Consensus, 2013 [5]).
    Note: The Beighton Scale is commonly used and cited to quantify hypermobility (Smith et al., 2008 [1b]; Smits-Engelsman, Klerks, & Kirby, 2011 [3b]; Cameron et al., 2010 [3b]; van der Giessen et al., 2001 [4b]) (see Appendix 2 in the original guideline document).

11. It is recommended that knee-specific scales in conjunction with general health instruments are used for a more thorough understanding of the patient's assessment of his or her own knee function and general function after RPI/PPD, which may include:
    - Knee specific instruments:
        - International Knee Documentation Committee (IKDC)/Pedi-IKDC
        - Kujala Patellofemoral Disorder Score
        - Lysholm
        - Tegner Activity Score
        - Fulkerson
    - General health instruments:
        - Short Form 36
        - Musculoskeletal Function Assessment
        - PedsQL

    (Smith et al., 2010 [1b]; Smith et al., 2008 [1b]; Paxton et al., 2003 [2a]; Briggs et al., 2009 [3b]; Local Consensus, 2013 [5]; Lysholm & Tegner, 2007 [5a])

    Note: There is conflicting evidence regarding whether specific outcome measures directly pertaining to patellar instability are clinically meaningful (Smith, Davies, & Donell, 2010 [1b]). Nonetheless, studies indicate that the IKDC, Kujala, Fulkerson, Lysholm, and Tegner scales have all been demonstrated to have acceptable test–retest reliability, with a coefficient ranging from 0.82 to 0.92. With respect to validity, the Fulkerson, Kujala, Lysholm and IKDC were all able to differentiate statistically between a first time dislocation group and that with a history of subluxation/dislocation ($p<0.01$). The Kujala and IKDC instruments had the highest internal consistencies of the knee-specific instruments (Cronbach alpha, >0.80). The test-retest coefficients of all knee-specific scales exceeded 0.80; yielding high reliability (Paxton et al., 2003 [2a]).

Patient and Family Centered Care

12. It is recommended that self-management education and skill building include tailored health education based on individual patient/family needs, risks, and readiness to change.
    Note: Self-management is the ability of the client and family to collaborate on and adhere to individualized therapy treatment recommendations and appropriately handle signs/symptoms/difficulties associated with the therapy and diagnosis to maximize quality of life and participation in life roles (Local Consensus, 2013 [5]; Lorig & Holman, 2003 [5b]).

13. It is recommended that the patient and family's ability to participate in the management of their condition is assessed with regard to:
    - Attitudes and beliefs, including confidence and importance (Williams et al., 2007 [3a])
    - Readiness to change (Local Consensus, 2013 [5])
14. It is recommended that in order to develop an individualized and collaborative plan of care, the following things patient and family are considered:
    - Understanding of the condition
    - Self-efficacy, beliefs and stage of readiness to address the condition
    - Degree of goal alignment with the health care team's goals
    - Dynamics and access to resources to adhere to health care professionals' recommendations regarding the condition
    - Potential barriers to being able to optimally attend physical therapy sessions and perform a home exercise program (HEP)

    (Local Consensus, 2013 [5]; Ryan & Sawin, 2009 [5a]; Holman & Lorig, 2004 [5b])

Physical Therapy Assessment and Diagnosis

15. It is recommended that clinicians synthesize subjective, objective and self-management information from the physical therapy examination to establish a physical therapy diagnosis and individualize a plan of care ("American Physical Therapy Association," 2003 [5a]).

Re-Assessment

16. It is recommended that quantitative and qualitative measures be re-assessed approximately every two weeks and/or at any point the patient experiences a significant change in status (Local Consensus, 2013 [5]).

Management Recommendations

17. It is recommended that physical therapy dosage be determined based upon the patients' needs, preferences and specific impairments and supplemented with a HEP (Friedrich, Cermak, & Maderbacher, 1996 [2b]; Local Consensus, 2013 [5]; Bailes, Reder, & Burch, 2008 [5a]).
    Note: Patients who participate in supervised clinical visits demonstrate greater gains in muscle strength, functional mobility, gait speed, and quality of exercise performance than those who receive a HEP alone or no instruction at all (Friedrich, Cermak, & Maderbacher, 1996 [2b]).

18. It is recommended that a functional-based goal progression model of advancement through the phases of rehabilitation be followed rather than a time-based progression model (Local Consensus, 2013 [5]).
    Note 1: All recommended milestones/goals may not be appropriate for every individual; appropriate rehabilitation progression relies on sound clinical judgment, a good understanding of the patient's pre-injury level of function and personal activity goals (Local Consensus, 2013 [5]).

    Note 2: Appendix 3a-d in the original guideline document provides a general overview of exercise and rehabilitation intervention suggestions that may be appropriate for each phase (Local Consensus, 2013 [5]).

Phases of Rehabilitation

General Interventions for All Phases

19. It is recommended that the following are performed for pain relief assistance as appropriate and necessary:
    - Cryotherapy (Rice, McNair, & Dalbeth, 2009 [2a]; Hopkins, 2006 [2a]; Singh et al., 2001 [2a]; Bolgla & Keskula, 2000 [5b])
    - Electrical stimulation and/or transcutaneous electrical nerve stimulation (TENS) per clinician discretion (Local Consensus, 2013 [5]; Palmieri-Smith, Thomas, & Wojtys, 2008 [5a])
    - Medications: Patients may be further encouraged to follow physician recommendations regarding taking pain-relieving medications (Local Consensus, 2013 [5])

Effusion

20. It is recommended that the following are used as available and appropriate for edema management:
    - Cryotherapy (Rice, McNair, & Dalbeth, 2009 [2a]; Hopkins, 2006 [2a]; Singh et al., 2001 [2a]; Bolgla & Keskula, 2000 [5b])
    - Vasopneumatic device (Holwerda et al., 2013 [3b])
    - Elastic compression wrap before and after therapy sessions (Janwantanakul, 2006 [4b]; Local Consensus, 2013 [5])

Initial Phase

This phase is designed to help patients prepare to engage in activities that will restore their ability to perform basic tasks associated with normalizing ROM and gait. Table 3 in the original guideline document highlights the specific goals and expected outcomes for the Initial Phase. Appendix 3a in the original guideline document provides a list of example exercises that may be appropriate for the Initial Phase. Some patients may skip this phase all together if, upon presentation, the goals/criteria for progression to the next phase have already been met (Local Consensus, 2013 [5]).

Initial Phase—ROM/Flexibility

21. It is recommended that passive static stretches for lower extremity musculature are utilized to assist with gains in ROM and flexibility (Moseley et al., 2005 [2a]; Bandy, Irion, & Briggler, 1998 [2a]; Davis et al., 2005 [2b]; Local Consensus, 2013 [5]).
    Note 1: Gradual progression of ROM will help minimize the negative side effects of pain elevation, muscle guarding, and joint inflammation (Local Consensus, 2013 [5]).

    Note 2: For patients with PPD, ROM may take longer to normalize secondary to the traumatic mechanism of injury (Local Consensus, 2013 [5]).

    Note 3: Dynamic ROM and active assistive ROM (AAROM) may be helpful if the patient is muscle guarding due to pain and unable to achieve end range motion with static stretch (Bandy, Irion, & Briggler, 1998 [2a]; Local Consensus, 2013 [5]).

22. It is recommended that AROM and AAROM are performed following stretching to maintain new gains in motion (Depino, Webright, & Arnold, 2000 [2b]).

Initial Phase—Muscle Strength and Control

23. It is recommended that strengthening exercises for this phase begin with isometric and isotonic exercises targeting hip and knee musculature in gravity-mitigated positions with progression to isotonic exercises against gravity as tolerated by patient (Local Consensus, 2013 [5]).
    Note 1: Isometric holds in varying degrees of hip flexion, hip abduction, and hip extension with the knee in full extension may help target key muscles while minimizing patellofemoral forces to limit pain (Local Consensus, 2013 [5]).

    Note 2: The addition of resistance to exercises and integration of eccentric-specific exercises may be appropriate for certain muscle groups and/or positions based on clinical judgment (Local Consensus, 2013 [5]).

    Note 3: Clinicians may want to avoid isokinetic exercises during this phase of treatment to minimize pain and risk for further injury (Local Consensus, 2013 [5]).

24. It is recommended that exercises are initiated with 2 sets of 10 to 15 repetitions of exercises as appropriate, with progression to 3 sets of each exercise as tolerated (Rhea, Alvar, & Burkett, 2002 [2b]; Faigenbaum et al., 1996 [4b]; Local Consensus, 2013 [5]).
    Note: If the patient is unable to perform 2 sets of 10 repetitions of an exercise, the intensity of the exercise may be modified per clinical judgment (Local Consensus, 2013 [5]).

25. It is recommended that visual, tactile and verbal feedback cues be provided as needed to ensure optimal performance for all exercises in every rehabilitation phase (Nikku et al., 2009 [4b]).
    Note: Individuals who receive regular positive feedback from a physical therapist are more likely to be adherent with a supplemental HEP (Sluijs, Kok, & van der Zee, 1993 [4b]).

26. It is recommended that neuromuscular electrical stimulation (NMES) be used in conjunction with exercise to facilitate quadriceps activation and strength (Fithian et al., 2004 [2a]; Snyder-Mackler et al., 1995 [2a]; Local Consensus, 2013 [5]).
27. It is recommended that additional isometric and isotonic strengthening exercises are implemented to target bilateral core and hip musculature (Powers, 2010 [5a]; Reinold et al., 2006 [5a]).

Initial Phase—Balance

28. It is recommended that balance exercises begin with an emphasis on symmetrical weight bearing in double limb stance with minimal to no assist and progressed to good control with weight-shifting in Anterior-Posterior and Medial-Lateral directions (Local Consensus, 2013 [5]).
    Note: Weight shifting in the anterior-posterior and medial-lateral directions may help to prepare the patient to progress away from dependence on an assistive device and help the patient progress to single leg balance in the next rehabilitation phase (Local Consensus, 2013 [5]).

Initial Phase — Gait

29. It is recommended that patient-specific ambulation exercises are implemented to improve the patient's ability to:
    - Weight bear as tolerated and appropriate per physician recommendation
    - Demonstrate adequate ROM in hip, knee and ankle at each phase of the gait cycle
    - Maintain good quadriceps control, particularly during stance phase
    - Decrease dependence on assistive device while maintaining good gait mechanics

    (Local Consensus, 2013 [5])

Initial Phase — Functional Tasks

30. It recommended that the patient is provided training and education in bed mobility, transfers and safe stair navigation with progression toward minimal use of assistive device as appropriate (Local Consensus, 2013 [5]).

Restoring Basic Function Phase

The purpose of this phase is to ensure the patient is able to perform all basic functional tasks associated with typical activities of daily living (e.g., walking longer distances, stooping, and stair navigation) (Local Consensus, 2013 [5]). The specific goals and expected outcomes for the Restoring Basic Function Phase are listed in Table 4 in the original guideline document. Appendix 3b in the original guideline document provides a list of example exercises that may be appropriate for the Restoring Basic Function Phase.

Restoring Basic Function Phase—ROM/Flexibility

31. It is recommended that passive static stretches for lower extremity musculature continue to be utilized to assist with gains in ROM and flexibility (Moseley et al., 2005 [2a]; Bandy, Irion, & Briggler, 1998 [2a]; Davis et al., 2005 [2b]; Local Consensus, 2013 [5]).
    Note: Dynamic ROM (Bandy, Irion, & Briggler, 1998 [2a]) may continue to be appropriate if the patient is muscle guarding due to pain and unable to achieve end range motion with static stretch (Local Consensus, 2013 [5]).

32. It is recommended that AROM and AAROM continue to be performed following stretching to maintain new gains in motion (Depino, Webright, & Arnold, 2000 [2b]).

Restoring Basic Function Phase — Muscle Strength and Control

33. It is recommended that strengthening exercises include resisted isometric and isotonic strengthening exercises (concentric and eccentric) specifically targeting the hip, knee and ankle musculature of the involved limb (Bolgla & Uhl, 2005 [4b]; Local Consensus, 2013 [5]; Powers, 2010 [5a]; Reinold et al., 2006 [5a]).
    Note 1: Isokinetic exercises may be appropriate to integrate in the later stages of this phase (Local Consensus, 2013 [5]).

    Note 2: It may be necessary to begin these exercises with lighter resistance (partial to body weight only) with progression to increased resistance per clinical judgment (Bolgla & Uhl, 2005 [4b]; Local Consensus, 2013 [5]).

34. It is recommended that NMES continue to be used as needed in conjunction with exercise to facilitate quadriceps activation and strength (Fithian et al., 2004 [2a]; Snyder-Mackler et al., 1995 [2a]; Local Consensus, 2013 [5]).
35. It is recommended that open kinetic chain exercises (OKCE) are incorporated into the strength training exercises for the involved limb (Escamilla et al., 1998 [4b]; Local Consensus, 2013 [5]).
    Note: For patients with patellofemoral pain and/or concomitant chondral lesions, it may be necessary to limit knee flexion ROM per clinical judgment to minimize pain or discomfort (Souza et al., 2010 [4b]; Local Consensus, 2013 [5]).

36. It is recommended that isotonic OKCE for knee flexion/extension are initially performed from 90 to 40 degrees for the involved limb to allow for enhanced osseous stability with progressions working toward exercises throughout the entire ROM (Escamilla et al., 1998 [4b]; Local Consensus, 2013 [5]).
37. It is recommended that isotonic closed kinetic chain Exercises (CKCE) are initiated using a double limb stance with a focus on neuromuscular control of the pelvis, femur, tibia, and patella during knee flexion ROM to encourage optimal alignment of all joints during movements (Local Consensus, 2013 [5]).
    Note 1: The initiation of single limb CKCE can begin per clinician discretion, with emphasis on patient's ability to demonstrate sufficient neuromuscular control to maintain good alignment of lower extremity throughout the activity (Local Consensus, 2013 [5]).

    Note 2: The following exercises can effectively target the quadriceps muscle group during the Restoring Basic Function Phase:

    - Forward step-ups
    - Lateral step-ups
    - Retro/reverse step-ups
    - Wall squats

    (Lubahn et al., 2011 [4a]; Ayotte et al., 2007 [4a]; Boren et al., 2011 [4b]; Mercer et al., 2009 [4b])

    Note 3: Exercises that can effectively target the gluteus medius during this phase of rehabilitation:

    - Double leg squat
    - Wall squat, forward step-u
    - Lateral step-up, side stepping
    - Side plank

    (Ayotte et al., 2007 [4a]; Boren et al., 2011 [4b]; Distefano et al., 2009 [4b]; Mercer et al., 2009 [4b]; Ekstrom, Donatelli, & Carp, 2007 [4b]; Local Consensus, 2013 [5])

    Note 4: Exercises that can be utilized to target the gluteus maximus:

    - Double leg squat
    - Forward step-up
    - Lateral step-up
    - Retro/reverse step-up

- Quadruped alternating upper extremity/lower extremity extension
- Forward lunges
- Wall squat

(Lubahn et al., 2011 [4a]; Ayotte et al., 2007 [4a]; Boren et al., 2011 [4b]; Mercer et al., 2009 [4b]; Ekstrom, Donatelli, & Carp, 2007 [4b])

38. It is recommended that a continued emphasis is placed on targeting hip, knee and ankle musculature of the uninvolved limb and any other muscle groups (e.g., core and trunk musculature) where significant strength deficits remain present (Bolgla & Uhl, 2005 [4b]; Powers, 2010 [5a]; Reinold et al., 2006 [5a]).
Note: Specific exercises that can effectively target core abdominal musculature include the following:

- Swiss ball roll-outs
- Swiss ball skier
- Swiss ball knee-up

(Escamilla et al., 1998 [4b])

Restoring Basic Function Phase—Balance

39. It is recommended that balance exercises for this phase include double limb stance challenges on dynamic surfaces and other external perturbations with an emphasis on transitioning to the ability to safely balance independently on a single leg.
Note: Patients at this stage may also be ready to begin more challenging single leg balance challenges that include unstable surfaces and external perturbations (Local Consensus, 2013 [5]).

Restoring Basic Function Phase—Gait

40. It is recommended that the remaining deficits in the gait cycle (e.g., quadriceps avoidance) continue to be emphasized to progress the patient off any assistive devices and normalize gait patterns on even and uneven surfaces (Local Consensus, 2013 [5]).

Restoring Basic Function Phase—Functional Tasks

41. It is recommended that for activities of daily living advanced training exercises such as the following be incorporated:
    - Repeated chair squats
    - Reciprocal stair climbing and single leg balance with floor touches or object pick-ups
    - Obstacle avoidance and quick changes/pivots in direction while ambulating

    (Local Consensus, 2013 [5])

Restoring Basic Function Phase—Cardiovascular

42. It is recommended that minimal intensity cardiovascular exercise be performed at a rate of perceived exertion (RPE) of 9 to 11 on the 6 to 20 Borg Scale or 3 to 4 on the Pictorial Children's Effort Rating Table (PCERT) (Roemmich et al., 2006 [4a]; Dunbar et al., 1992 [4b]; Local Consensus, 2013 [5]; Groslambert & Mahon, 2006 [5a]).
Note: RPE has been shown to be a valid and reliable measurement of exertion and correlated with heart rate produced during physical activity (Dunbar et al., 1992 [4b]; Groslambert & Mahon, 2006 [5a]).

Restoring Advanced Function Phase

The purpose of this phase is to fully restore the patient's ability to engage in pre-injury levels of function and build symmetry between involved and uninvolved limbs. See Table 5 in the original guideline document for a list of specific goals and expected outcomes for the Restoring Advanced Function Phase. Appendix 3c in the original guideline document provides a list of example exercises that may be appropriate for the Restoring Advanced Function Phase. By the end of this phase, patients should be able to meet the Centers for Disease Control recommended guidelines for physical activity with the ability to participate in all activities expected for healthy, typically-developing children such as full participation in physical activity classes and at least 60 minutes of activity of moderate intensity (e.g., brisk walking) and vigorous intensity (e.g., running) a day (Local Consensus, 2013 [5]; U.S. Department of Health and Human Services [DHHS], 2008 [5a]).

Restoring Advanced Function Phase—ROM/Flexibility

43. It is recommended that passive static stretches for lower extremity musculature continue to be utilized to assist with gains and/or maintenance of good ROM and flexibility (Moseley et al., 2005 [2a]; Bandy, Irion, & Briggler, 1998 [2a]; Davis et al., 2005 [2b]; Local Consensus, 2013 [5]).

44. It is recommended that manual therapy techniques such as more aggressive manual stretching and joint mobilizations are utilized if ROM deficits continue to be present in the involved knee (Local Consensus, 2013 [5]).

Restoring Advanced Function Phase—Muscle Strength and Control

45. It is recommended that isotonic and isokinetic resistance exercises targeting the knee, hip and ankle musculature of the involved knee continue to be integrated into therapeutic exercises (Local Consensus, 2013 [5]).
    Note: Level of resistance may be increased and increased ROM may be utilized for both OKCE and CKCE as tolerated by the patient and within the patient's ability to maintain good core, hip, knee and foot alignment (Local Consensus, 2013 [5]).

46. It is recommended that a continued emphasis is placed on good control, alignment and appropriate muscle recruitment for double leg and single leg activities with an increased number of repetitions and improved endurance with isometric holds (Local Consensus, 2013 [5]).
    Note 1: Exercises emphasizing full-body dynamic movements in multiple planes of motion that incorporate strength and endurance building for core musculature and trunk stability (Powers, 2010 [5a]; Reinold et al., 2006 [5a]; Greiwe et al., 2010 [5b]) and strengthening activities performed on both static and dynamic surfaces can be particularly useful during the Restoring Advanced Function Phase (Local Consensus, 2013 [5]; Reinold et al., 2006 [5a], Bolgla & Keskula, 2000 [5b]).

    Note 2: The following exercises can effectively target the gluteus medius:

    - Single leg squat
    - Single leg balance with hip abduction
    - Single leg bridges in supine
    - Single leg deadlifts
    - Side planks with hip abduction

    (Lubahn et al., 2011 [4a]; Boren et al., 2011 [4b]; Distefano et al., 2009 [4b]; Ekstrom, Donatelli, & Carp, 2007 [4b]; Bolgla & Uhl, 2005 [4b])

    Note 3: The following exercises can effectively target the gluteus maximus:

    - Single leg squat
    - Single leg bridge
    - Side plank with hip abduction
    - Front plank with hip extension
    - Single leg deadlift
    - Transverse lunges

    (Lubahn et al., 2011 [4a]; Boren et al., 2011 [4b]; Distefano et al., 2009 [4b]; Ekstrom, Donatelli, & Carp, 2007 [4b])

    Note 4: The following exercises can effectively target the core abdominal muscles:

    - Swiss ball pike
    - Swiss ball roll-out with hip extension
    - Front plank with hip extension
    - Side plank with hip abduction

    (Boren et al., 2011 [4b]; Escamilla et al., 1998 [4b])

Restoring Advanced Function Phase—Balance

47. It is recommended that balance training activities include more advanced activities for single leg balance with perturbations on unstable surfaces (Local Consensus, 2013 [5]).

Restoring Advanced Function Phase—Gait

48. It is recommended that exercise interventions that emphasize good, symmetrical and safe gait patterns for jogging and running are integrated into this phase (Local Consensus, 2013 [5]).
    Note: Even if a patient did not engage in running activities regularly prior to injury, it is likely they may be expected to participate in at least low-level running activities for physical education classes or for participation at recess with classmates. Therefore, it is important to ensure the patient is able to run at least short distances safely using good form (Local Consensus, 2013 [5]).

Restoring Advanced Function Phase—Functional Tasks

49. It is recommended that exercises are integrated that emphasize:
    - Quick changes in direction on stable and unstable surfaces and even and uneven step-heights
    - That increase intensity and dynamic motions associated with activities of daily living (ADLs) or work/play related tasks (e.g. squatting or lunging quickly with heavier weight to replicate lifting heavier boxes/object from the floor) with emphasis on mechanics
    - Age-appropriate activities such as skipping, double leg hopping, single leg hopping, skipping and jogging per patient and family goals and to return to desired physical activity

    (Local Consensus, 2013 [5])

    Note: These exercises emphasize improving the patient's ability to fully participate in physical education class and/or in recreational activities and are task or sport-specific such as being able to navigate the playground, participate in physical education classes or engage in the work environment safely (Local Consensus, 2013 [5]).

Restoring Advanced Function Phase—Cardiovascular

50. It is recommended that moderate intensity cardiovascular exercises are integrated with a RPE of 12 to 14 on the 6 to 20 Borg Scale or 5 to 6 on the PCERT and vigorous intensity exercise be performed with a RPE of 15 to 17 or 7 to 8 on the PCERT (Roemmich et al., 2006 [4a]; Dunbar et al., 1992 [4b]; Local Consensus, 2013 [5]; Groslambert & Mahon, 2006 [5a]).

Return-to-Activity Phase

Successful attainment of the goals for the Restoring Advanced Function Phase is used as indication of the individual's readiness to reintegrate into higher level activities. If the patient's highest level of personal functional goals have been met at this time, and clinical judgment dictates the patient is able to perform all age-appropriate types of activities (e.g., full participation in physical education classes), it may appropriate to discharge patient at this time. Appendix 3d in the original guideline document provides a list of example exercises that may be useful for the Return-to-Activity Phase.

51. It is recommended that progressive reintegration into activities be conducted according to the Cincinnati Children's Hospital Medical Center (CCHMC) guideline Evidence-based care guideline for return to activity after lower extremity injury in children and young adults ages 5 through 22 years.

Discharge Criteria

52. It is recommended that discharge from therapy be based on clinical judgment, attainment of goals, and successful participation in desired activities (Local Consensus, 2013 [5]).

Definitions:

Table of Evidence Levels

Quality Level	Definition
1a† or 1b†	Systematic review, meta-analysis, or meta-synthesis of multiple studies
2a or 2b	Best study design for domain
3a or 3b	Fair study design for domain
4a or 4b	Weak study design for domain
5a or 5b	General review, expert opinion, case report, consensus report, or guideline
5	Local Consensus

†a = good quality study; b = lesser quality study.

Table of Recommendation Strength

Strength	Definition
"Strongly recommended"	There is consensus that benefits clearly outweigh risks and burdens (or vice-versa for negative

Strength	Definition
"Recommended"	There is consensus that benefits are closely balanced with risks and burdens.
No recommendation made	There is lack of consensus to direct development of a recommendation.

Note: See the original guideline document for the dimensions used for judging the strength of the recommendation.

Clinical Algorithm(s)

None provided

Scope

Disease/Condition(s)

- Lateral patellar dislocations/subluxations
- Lateral patellar instability

Guideline Category

Evaluation

Management

Treatment

Clinical Specialty

Family Practice

Pediatrics

Physical Medicine and Rehabilitation

Intended Users

Advanced Practice Nurses

Nurses

Other

Patients

Physical Therapists

Physician Assistants

Physicians

Guideline Objective(s)

- To provide a comprehensive description of evaluation and intervention strategies for conservative management of lateral patellar instability
- To guide and promote consistency in the delivery of optimal evidence-based physical therapy services for non-surgical, conservative management of primary patellar dislocation (PPD) and recurrent patellar instability (RPI)
- To promote long-term joint integrity and maximize healing
- To reduce impairment
- To enhance function
- To maintain and improve patient and family satisfaction and quality of life
- To minimize risk for re-injury

Target Population

Children or young adults, ages 8-25 years, with history of lateral patellar dislocation, subluxation or general patellar instability in one or both knees who are going to be conservatively managed

Note: Children or young adults following surgical patellar stabilization techniques or with neuro-developmental conditions associated with patellar instability or dislocation (e.g., cerebral palsy, Down Syndrome) are excluded from this guideline.

Interventions and Practices Considered

Assessment

1. Review of general medical history and imaging studies
2. Assessment and localization of pain using appropriate scale
3. Comprehensive objective physical therapy exam
4. Comprehensive knee screen
5. Assessment of joint hypermobility
6. Assessment of knee function using knee-specific scales in conjunction with general health instruments

Management/Treatment

1. Self-management education and skill building
2. Patient/family education about condition management
3. Pain relief assistance
    - Cryotherapy
    - Electrical stimulation and/or transcutaneous electrical nerve stimulation (TENS)
    - Medication
4. Edema management
    - Cryotherapy
    - Vasopneumatic device
    - Elastic compression wrap
5. Physical therapy
    - Range of motion (ROM) and flexibility exercises (passive static stretches)
    - Muscle strength and control exercises
        - Isometric and isotonic strengthening exercises
        - Provision of visual, tactile and verbal feedback cues
        - Neuromuscular electrical stimulation (NMES)
        - Resisted isometric, isotonic and isokinetic strengthening exercises (open kinetic chain exercises [OKCE], closed kinetic chain exercises [CKCE])
        - Emphasis on good control, alignment and appropriate muscle recruitment for double leg and single leg activities
    - Balance exercises and advanced balance training activities
    - Patient-specific ambulation exercises
    - Training and education in bed mobility, transfers and safe stair navigation
    - Exercise interventions emphasizing good, symmetrical and safe gait patterns
    - Activities of daily living advanced training exercises

    - Minimal intensity and moderate intensity cardiovascular exercise
    - Manual therapy techniques
    - Advanced functional task exercises
6. Progressive reintegration into activities
7. Discharge criteria

Major Outcomes Considered

- Ability to participate with self-report of pain
- Range of motion/flexibility
- Muscle strength and control
- Balance
- Gait
- Ability to perform functional tasks

Methodology

Methods Used to Collect/Select the Evidence

Hand-searches of Published Literature (Primary Sources)

Hand-searches of Published Literature (Secondary Sources)

Searches of Electronic Databases

Description of Methods Used to Collect/Select the Evidence

To select evidence for critical appraisal by the group for this guideline, the MEDLINE, EMBASE and the Cochrane databases were searched for dates of October 23, 2013 to generate an unrefined, "combined evidence" database using a search strategy focused on answering clinical questions relevant to patellar instability and employing a combination of Boolean searching on human-indexed thesaurus terms (medical subject headings [MeSH] headings using an OVID MEDLINE interface) and "natural language" searching on words in the title, abstract, and indexing terms. The key words used were: "Patellar Instability," "Patellar instability," "Patellar Dislocation," "Patella Dislocation," "Medial Patellofemoral Ligament," "MPFL," "Patellar Subluxation", and "Patellar Subluxation".

The citations were reduced by: eliminating duplicates, review articles, non-English articles, and adult articles. The resulting abstracts were reviewed by team members to eliminate low quality and irrelevant citations. During the course of the guideline development, additional clinical questions were generated and subjected to the search process, and some relevant review articles were identified. September 18, 2013 was the last date for which literature was reviewed for the previous version of this guideline. The details of that review strategy are not documented. However, all previous citations were reviewed for appropriateness to this revision.

Number of Source Documents

Not stated

Methods Used to Assess the Quality and Strength of the Evidence

Weighting According to a Rating Scheme (Scheme Given)

Rating Scheme for the Strength of the Evidence

Table of Evidence Levels

Quality Level	Definition
1a† or 1b†	Systematic review, meta-analysis, or meta-synthesis of multiple studies
2a or 2b	Best study design for domain
3a or 3b	Fair study design for domain
4a or 4b	Weak study design for domain
5a or 5b	General review, expert opinion, case report, consensus report, or guideline
5	Local Consensus

†a = good quality study; b = lesser quality study.

Methods Used to Analyze the Evidence

Review of Published Meta-Analyses

Systematic Review

Description of the Methods Used to Analyze the Evidence

Not stated

Methods Used to Formulate the Recommendations

Expert Consensus

Description of Methods Used to Formulate the Recommendations

The process by which this guideline was developed is documented in the Guideline Development Process Manual (see the "Availability of Companion Documents" field); relevant development materials are kept electronically. The recommendations contained in this guideline were formulated by an interdisciplinary working group which performed systematic search and critical appraisal of the literature, using the Table of Evidence Levels (see the "Rating Scheme for the Strength of the Evidence" field), and examined current local clinical practices.

Recommendations have been formulated by a consensus process directed by best evidence, patient and family preference and clinical expertise. During formulation of these recommendations, the team members have remained cognizant of controversies and disagreements over the management of these patients. They have tried to resolve controversial issues by consensus where possible and, when not possible, to offer optional approaches to care in the form of information that includes best supporting evidence of efficacy for alternative choices.

Rating Scheme for the Strength of the Recommendations

Table of Recommendation Strength

Strength	Definition
"Strongly recommended"	There is consensus that benefits clearly outweigh risks and burdens (or vice-versa for negative recommendations).
"Recommended"	There is consensus that benefits are closely balanced with risks and burdens.
No recommendation	There is lack of consensus to direct development of a recommendation.

Strength made	Definition

Note: See the original guideline document for the dimensions used for judging the strength of the recommendation.

Cost Analysis

A formal cost analysis was not performed and published cost analyses were not reviewed.

Method of Guideline Validation

External Peer Review

Internal Peer Review

Description of Method of Guideline Validation

- The recommendation statements were formally reviewed by other physical therapists, physicians and athletic trainers. In addition, specific feedback regarding patient and family needs and preferences were obtained through a review process with former patients and family members who have undergone conservative management of lateral patellar instability.
- The guideline has been reviewed and approved by clinical experts not involved in the development process, distributed to senior management, and other parties as appropriate to their intended purposes.

Evidence Supporting the Recommendations

References Supporting the Recommendations

American Physical Therapy Association: guide to physical therapist practice. Rev to Second Edition. American Physical Therapy Association; 2003. 9-746 p.

Andrish J. The management of recurrent patellar dislocation. Orthop Clin North Am. 2008 Jul;39(3):313-27, vi. PubMed

Ayotte NW, Stetts DM, Keenan G, Greenway EH. Electromyographical analysis of selected lower extremity muscles during 5 unilateral weight-bearing exercises. J Orthop Sports Phys Ther. 2007 Feb;37(2):48-55. PubMed

Bailes AF, Reder R, Burch C. Development of guidelines for determining frequency of therapy services in a pediatric medical setting. Pediatr Phys Ther. 2008;20(2):194-8. PubMed

Bandy WD, Irion JM, Briggler M. The effect of static stretch and dynamic range of motion training on the flexibility of the hamstring muscles. J Orthop Sports Phys Ther. 1998 Apr;27(4):295-300. PubMed

Beyer JE, Turner SB, Jones L, Young L, Onikul R, Bohaty B. The alternate forms reliability of the Oucher pain scale. Pain Manag Nurs. 2005 Mar;6(1):10-7. PubMed

Bolgla LA, Keskula DR. A review of the relationship among knee effusion, quadriceps inhibition, and knee function. J Sport Rehabil. 2000;9(2):160-8.

Bolgla LA, Uhl TL. Electromyographic analysis of hip rehabilitation exercises in a group of healthy subjects. J Orthop Sports Phys Ther. 2005 Aug;35(8):487-94. PubMed

Boren K, Conrey C, Le Coguic J, Paprocki L, Voight M, Robinson TK. Electromyographic analysis of gluteus medius and gluteus maximus during rehabilitation exercises. Int J Sports Phys Ther. 2011 Sep;6(3):206-23. PubMed

Briggs KK, Steadman JR, Hay CJ, Hines SL. Lysholm score and Tegner activity level in individuals with normal knees. Am J Sports Med. 2009 May;37(5):898-901. PubMed

Cameron KL, Duffey ML, DeBerardino TM, Stoneman PD, Jones CJ, Owens BD. Association of generalized joint hypermobility with a history of glenohumeral joint instability. J Athl Train. 2010 May-Jun;45(3):253-8. PubMed

Davis DS, Ashby PE, McCale KL, McQuain JA, Wine JM. The effectiveness of 3 stretching techniques on hamstring flexibility using consistent stretching parameters. J Strength Cond Res. 2005 Feb;19(1):27-32. PubMed

Depino GM, Webright WG, Arnold BL. Duration of maintained hamstring flexibility after cessation of an acute static stretching protocol. J Athl Train. 2000 Jan;35(1):56-9. PubMed

Distefano LJ, Blackburn JT, Marshall SW, Padua DA. Gluteal muscle activation during common therapeutic exercises. J Orthop Sports Phys Ther. 2009 Jul;39(7):532-40. PubMed

Dunbar CC, Robertson RJ, Baun R, Blandin MF, Metz K, Burdett R, Goss FL. The validity of regulating exercise intensity by ratings of perceived exertion. Med Sci Sports Exerc. 1992 Jan;24(1):94-9. PubMed

Ekstrom RA, Donatelli RA, Carp KC. Electromyographic analysis of core trunk, hip, and thigh muscles during 9 rehabilitation exercises. J Orthop Sports Phys Ther. 2007 Dec;37(12):754-62. PubMed

Escamilla RF, Fleisig GS, Zheng N, Barrentine SW, Wilk KE, Andrews JR. Biomechanics of the knee during closed kinetic chain and open kinetic chain exercises. Med Sci Sports Exerc. 1998 Apr;30(4):556-69. PubMed

Faigenbaum AD, Westcott WL, Micheli LJ, Outerbridge AR, Long CJ, LaRosa-Loud R, Zaichkowsky LD. The effects of strength training and detraining on children. J Strength Cond Res. 1996;10(2):110-14.

Fithian DC, Paxton EW, Stone ML, Silva P, Davis DK, Elias DA, White LM. Epidemiology and natural history of acute patellar dislocation. Am J Sports Med. 2004 Jul-Aug;32(5):1114-21. PubMed

Friedrich M, Cermak T, Maderbacher P. The effect of brochure use versus therapist teaching on patients performing therapeutic exercise and on changes in impairment status. Phys Ther. 1996 Oct;76(10):1082-8. PubMed

Greiwe RM, Saifi C, Ahmad CS, Gardner TR. Anatomy and biomechanics of patellar instability. Oper Tech Sports Med. 2010;18(2):62-7.

Groslambert A, Mahon AD. Perceived exertion : influence of age and cognitive development. Sports Med. 2006;36(11):911-28. PubMed

Holman H, Lorig K. Patient self-management: a key to effectiveness and efficiency in care of chronic disease. Public Health Rep. 2004 May-Jun;119(3):239-43. PubMed

Holwerda SW, Trowbridge CA, Womochel KS, Keller DM. Effects of cold modality application with static and intermittent pneumatic compression on tissue temperature and systemic cardiovascular responses. Sports Health. 2013 Jan;5(1):27-33. PubMed

Hopkins JT. Knee joint effusion and cryotherapy alter lower chain kinetics and muscle activity. J Athl Train. 2006 Apr-Jun;41(2):177-84. PubMed

Janwantanakul P. Cold pack/skin interface temperature during ice treatment with various levels of compression. Physiotherapy. 2006;92(4):254-9.

Lorig KR, Holman H. Self-management education: history, definition, outcomes, and mechanisms. Ann Behav Med. 2003 Aug;26(1):1-7. PubMed

Lubahn AJ, Kernozek TW, Tyson TL, Merkitch KW, Reutemann P, Chestnut JM. Hip muscle activation and knee frontal plane motion during weight bearing therapeutic exercises. Int J Sports Phys Ther. 2011 Jun;6(2):92-103. PubMed

Lysholm J, Tegner Y. Knee injury rating scales. Acta Orthop. 2007 Aug;78(4):445-53. PubMed

Mercer VS, Gross MT, Sharma S, Weeks E. Comparison of gluteus medius muscle electromyographic activity during forward and lateral step-up exercises in older adults. Phys Ther. 2009 Nov;89(11):1205-14. PubMed

Moseley AM, Herbert RD, Nightingale EJ, Taylor DA, Evans TM, Robertson GJ, Gupta SK, Penn J. Passive stretching does not enhance outcomes in patients with plantarflexion contracture after cast immobilization for ankle fracture: a randomized controlled trial. Arch Phys Med Rehabil. 2005 Jun;86(6):1118-26. PubMed

Nietosvaara Y, Aalto K, Kallio PE. Acute patellar dislocation in children: incidence and associated osteochondral fractures. J Pediatr Orthop. 1994 Jul-Aug;14(4):513-5. PubMed

Nikku R, Nietosvaara Y, Aalto K, Kallio PE. The mechanism of primary patellar dislocation: trauma history of 126 patients. Acta Orthop. 2009 Aug;80(4):432-4. PubMed

Palmieri-Smith RM, Thomas AC, Wojtys EM. Maximizing quadriceps strength after ACL reconstruction. Clin Sports Med. 2008 Jul;27(3):405-24, vii-ix. PubMed

Paxton EW, Fithian DC, Stone ML, Silva P. The reliability and validity of knee-specific and general health instruments in assessing acute patellar dislocation outcomes. Am J Sports Med. 2003 Jul-Aug;31(4):487-92. PubMed

Powers CM. The influence of abnormal hip mechanics on knee injury: a biomechanical perspective. J Orthop Sports Phys Ther. 2010 Feb;40(2):42-51. PubMed

Reinold MM, Wilk KE, Macrina LC, Dugas JR, Cain EL. Current concepts in the rehabilitation following articular cartilage repair procedures

in the knee. J Orthop Sports Phys Ther. 2006 Oct;36(10):774-94. PubMed

Rhea MR, Alvar BA, Burkett LN. Single versus multiple sets for strength: a meta-analysis to address the controversy. Res Q Exerc Sport. 2002 Dec;73(4):485-8. PubMed

Rice D, McNair PJ, Dalbeth N. Effects of cryotherapy on arthrogenic muscle inhibition using an experimental model of knee swelling. Arthritis Rheum. 2009 Jan 15;61(1):78-83. PubMed

Roemmich JN, Barkley JE, Epstein LH, Lobarinas CL, White TM, Foster JH. Validity of PCERT and OMNI walk/run ratings of perceived exertion. Med Sci Sports Exerc. 2006 May;38(5):1014-9. PubMed

Ryan P, Sawin KJ. The Individual and Family Self-Management Theory: background and perspectives on context, process, and outcomes. Nurs Outlook. 2009 Jul-Aug;57(4):217-225.e6. PubMed

Singh H, Osbahr DC, Holovacs TF, Cawley PW, Speer KP. The efficacy of continuous cryotherapy on the postoperative shoulder: a prospective, randomized investigation. J Shoulder Elbow Surg. 2001 Nov-Dec;10(6):522-5. PubMed

Slabaugh MA, Hess DJ, Bajaj S, Farr J, Cole BJ. Management of chondral injuries associated with patellar instability. Oper Tech Sports Med. 2010;18(2):115-22.

Sluijs EM, Kok GJ, van der Zee J. Correlates of exercise compliance in physical therapy. Phys Ther. 1993 Nov;73(11):771-82; discussion 783-6. PubMed

Smith TO, Davies L, Chester R, Clark A, Donell ST. Clinical outcomes of rehabilitation for patients following lateral patellar dislocation: a systematic review. Physiotherapy. 2010 Dec;96(4):269-81. PubMed

Smith TO, Davies L, Donell ST. Immobilization regime following lateral patellar dislocation: a systematic review and meta-analysis of the current evidence base. Eur J Trauma Emerg Surg. 2010;36(4):353-60.

Smith TO, Davies L, ODriscoll ML, Donell ST. An evaluation of the clinical tests and outcome measures used to assess patellar instability. Knee. 2008 Aug;15(4):255-62. PubMed

Smits-Engelsman B, Klerks M, Kirby A. Beighton score: a valid measure for generalized hypermobility in children. J Pediatr. 2011 Jan;158(1):119-23, 123.e1-4. PubMed

Snyder-Mackler L, Delitto A, Bailey SL, Stralka SW. Strength of the quadriceps femoris muscle and functional recovery after reconstruction of the anterior cruciate ligament. A prospective, randomized clinical trial of electrical stimulation. J Bone Joint Surg Am. 1995 Aug;77(8):1166-73. PubMed

Souza RB, Draper CE, Fredericson M, Powers CM. Femur rotation and patellofemoral joint kinematics: a weight-bearing magnetic resonance imaging analysis. J Orthop Sports Phys Ther. 2010 May;40(5):277-85. PubMed

Stefancin JJ, Parker RD. First-time traumatic patellar dislocation: a systematic review. Clin Orthop Relat Res. 2007 Feb;455:93-101. PubMed

U.S. Department of Health and Human Services (DHHS). Physical activity guideline. Washington (DC): U.S. Department of Health and Human Services (DHHS); 2008.

van der Giessen LJ, Liekens D, Rutgers KJ, Hartman A, Mulder PG, Oranje AP. Validation of beighton score and prevalence of connective tissue signs in 773 Dutch children. J Rheumatol. 2001 Dec;28(12):2726-30. PubMed

von Baeyer CL, Spagrud LJ, McCormick JC, Choo E, Neville K, Connelly MA. Three new datasets supporting use of the Numerical Rating Scale (NRS-11) for children's self-reports of pain intensity. Pain. 2009 Jun;143(3):223-7. PubMed

Wilk KE, Davies GJ, Mangine RE, Malone TR. Patellofemoral disorders: a classification system and clinical guidelines for nonoperative rehabilitation. J Orthop Sports Phys Ther. 1998 Nov;28(5):307-22. PubMed

Williams EC, Horton NJ, Samet JH, Saitz R. Do brief measures of readiness to change predict alcohol consumption and consequences in primary care patients with unhealthy alcohol use?. Alcohol Clin Exp Res. 2007 Mar;31(3):428-35.

Williamson A, Hoggart B. Pain: a review of three commonly used pain rating scales. J Clin Nurs. 2005 Aug;14(7):798-804. PubMed

Type of Evidence Supporting the Recommendations

The type of supporting evidence is identified and graded for each recommendation (see the "Major Recommendations" field).

Benefits/Harms of Implementing the Guideline Recommendations

Potential Benefits

Appropriate evidence-based care for conservative management of lateral patellar dislocations and instability in children and young adults aged 8-25 years

Potential Harms

- Underlying concomitant tissue damage such as chondral lesions that can lead to long-term pain or loose bodies in the joint may lead to limitations or difficulties with full implementation of these guidelines.
- Pre-disposing anatomical abnormalities may reduce a patient's chances for long-term success of the implementation of these guidelines to reduce lateral patellar instability.

Qualifying Statements

Qualifying Statements

These recommendations result from review of literature and practices current at the time of their formulations. This guideline does not preclude using care modalities proven efficacious in studies published subsequent to the current revision of this document. This document is not intended to impose standards of care preventing selective variances from the recommendations to meet the specific and unique requirements of individual patients. Adherence to this guideline is voluntary. The clinician in light of the individual circumstances presented by the patient must make the ultimate judgment regarding the priority of any specific procedure.

Implementation of the Guideline

Description of Implementation Strategy

An implementation strategy was not provided.

Institute of Medicine (IOM) National Healthcare Quality Report Categories

IOM Care Need

Getting Better

IOM Domain

Effectiveness

Patient-centeredness

Identifying Information and Availability

Bibliographic Source(s)

Cincinnati Children's Hospital Medical Center. Evidence-based care guideline for conservative management of lateral patellar dislocations and instability in children and young adults aged 8-25 years. Cincinnati (OH): Cincinnati Children's Hospital Medical Center; 2014 Mar 18. 30 p. [100 references]

Adaptation

Not applicable: The guideline was not adapted from another source.

Date Released

2014 Mar 18

Guideline Developer(s)

Cincinnati Children's Hospital Medical Center - Hospital/Medical Center

Source(s) of Funding

Cincinnati Children's Hospital Medical Center

The guideline was developed without external funding

Guideline Committee

Division of Occupational Therapy and Physical Therapy Guideline Development Team

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Financial Disclosures/Conflicts of Interest

All Team Members and Anderson Center support staff listed have declared whether they have any conflict of interest and none were identified.

Guideline Status

This is the current release of the guideline.

Guideline Availability

Electronic copies: Available in Portable Document Format (PDF) from the Cincinnati Children's Hospital Medical Center Web site .

Print copies: For information regarding the full-text guideline, print copies, or evidence-based practice support services contact the Cincinnati Children's Hospital Medical Center Health James M. Anderson Center for Health Systems Excellence at EBDMInfo@cchmc.org.

Availability of Companion Documents

The following are available:

- Evidence-based care guideline development and update process. Cincinnati (OH): Cincinnati Children's Hospital Medical Center; 2006 Mar. 35 p. Available from the Cincinnati Children's Hospital Medical Center (CCHMC) Web site .
- Judging the strength of a recommendation. Cincinnati (OH): Cincinnati Children's Hospital Medical Center; 2009 May 7. 1 p. Available from the CCHMC Web site .
- Grading a body of evidence to answer a clinical question. Cincinnati (OH): Cincinnati Children's Hospital Medical Center; 2009 May 7. 1 p. Available from the CCHMC Web site .
- Table of evidence levels. Cincinnati (OH): Cincinnati Children's Hospital Medical Center; 2009 May 7. 1 p. Available from the CCHMC Web site .

Patient Resources

None available

NGC Status

This NGC summary was completed by ECRI Institute on June 18, 2014.

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